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NIDA's 2009 Avant-Garde Awards for Innovative HIV/AIDS Research Announced

Selected Research Focuses on Imaging the Viral Synapse, Immune System Restoration, Natural HIV Silencing Mechanisms and Elimination of Latent HIV Infections

Four scientists have been selected as this year's winners of the Avant-Garde Award for HIV/AIDS research, the National Institute on Drug Abuse, part of the National Institutes of Health, announced today. The annual award competition, now in its second year, is intended to stimulate high-impact research that may lead to groundbreaking opportunities for the prevention and treatment of HIV/AIDS in drug abusers. Winning scientists receive \$500,000 per year, plus associated facilities and administrative costs, for five years to support their research.

The four awardees will undertake diverse approaches in their research on HIV. One scientist will investigate the interactions that occur between HIV-infected and uninfected cells during intravenous transmission. Another researcher is developing new strategies to restore the immune system of HIV-infected individuals. The third will work on developing a new technology that exploits a silencing mechanism to block HIV transcription. The last will focus on identifying and eliminating latent HIV infection. This collective research will further NIDA's work to learn more about the pivotal role of drug abuse in the spread of HIV/AIDS and to develop effective strategies to prevent and treat this disease.

The Avant-Garde Awards are modeled after the NIH Pioneer Awards and are granted to scientists of exceptional creativity who propose high-impact research that will open new avenues for prevention and treatment of HIV/AIDS among drug abusers. "By supporting bold investigators with unexplored ideas, we hope we can find new approaches to eradicating the terrible public health toll of HIV/AIDS," said NIH Director Francis Collins.

"This year's Avant-Garde recipients proposed some especially exciting research directions," said NIDA Director Nora D. Volkow, who announced the awards. "These studies of fundamental processes in HIV infection should move us ahead by leaps and bounds in our efforts to find solutions to HIV/AIDS."

The Avant-Garde Awardees were selected from 39 applicants whose proposals reflect diverse scientific disciplines and approaches to HIV/AIDS research. The Avant-Garde Awards were granted to the following researchers:

Awardee: Benjamin K. Chen, M.D., Ph.D., assistant professor in the Department of Infectious Diseases at Mount Sinai School of Medicine, New York, is an investigator of exceptional vision

and promise. He developed methodology that enables visualization of fluorescently tagged HIV virus particles that may answer long-standing questions about cell-cell mechanisms of viral transmission.

Project: Imaging Virological Synapses During Parenteral HIV Transmission

The understanding of how the HIV virus spreads among injection drug users is limited by a poor understanding of the first events that occur following HIV transmission. This research uses sensitive virus tagging approaches and mouse models with humanized immune systems to study the sequence of interactions between HIV-infected cells and uninfected cells. These studies may lead to the development of vaccines or other preventive approaches to inhibit these initial interactions that occur during intravenous transmission.

Awardee: Dana H. Gabuzda, M.D., is a professor of neurology (microbiology) at the Dana Farber Cancer Institute and Harvard Medical School, in Boston. Dr. Gabuzda is a leading researcher in the areas of HIV molecular biology and pathogenesis, particularly neuropathogenesis. Her cutting-edge research has significantly increased understanding of HIV replication and pathogenesis.

Project: Systems Biology of Immune Reconstitution in HIV/AIDS

A major challenge in HIV research is to restore immune function in HIV-infected individuals. HIV infection depletes CD4 T cells, leading to immunodeficiency and death. Highly active anti-retroviral therapy (HAART) restores CD4 T cell counts to normal levels in a majority of individuals who achieve suppression of HIV to undetectable levels. However, the magnitude of CD4 T cell recovery is variable and many people on HAART have poor CD4 T cell recovery. The research will lead to a better understanding of the mechanisms that determine CD4 T cell restoration in IV drug abusers and other populations infected with HIV, and may identify new therapeutic strategies to improve restoration of immune function in these populations.

Awardee: Jonathan Karn, Ph.D., is a professor and chairman of molecular biology and microbiology at Case Western Reserve University, in Cleveland. Dr. Karn is a creative molecular biologist whose research on novel therapeutic technologies could have an impact on the HIV/AIDS epidemic worldwide.

Project: Manipulating Epigenetic Control Mechanisms to Control HIV Transcription

Most individuals treated with antiretroviral drugs have little to no detectable HIV in their blood, however, this does not mean that the virus has been cleared from the body. Unfortunately, the virus can re-emerge, leading to renewed active infections when treatment stops or fails. This research will focus on finding natural mechanisms that could block HIV replication and provide long-lasting suppression of HIV.

Awardee: Rafick-Pierre Sekaly, Ph.D., co-director and scientific director of the Vaccine and Gene Therapy Institute in Port St. Lucie, Florida is an internationally recognized leader in the field of human immunology and translational medicine, specifically the immune response to HIV infection.

Project: Novel Concepts for the Eradication of HIV

The HIV-1 reservoir is a small pool of persistent long-lived and latently infected resting memory CD4 T cells. Eradication of this HIV reservoir is one of the last steps to be conquered in order to develop a cure for this disease. Dr. Sekaly's research will probe for a mechanism explaining the existence of HIV reservoirs. His studies of pathways that can be targeted to purge HIV from its reservoir could ultimately lead to novel immunological interventions for the treatment of HIV.

NIDA's HIV/AIDS Research Program supports a multidisciplinary portfolio that investigates the role of drug use and its related behaviors in the evolving dynamics of HIV/AIDS epidemiology, natural history/pathogenesis, treatment, and prevention. <http://www.drugabuse.gov/AIDS>.

For further information about the Avant-Garde Award, please visit the NIDA Avant-Garde Award Web site at <http://drugabuse.gov/avgp.html>. Information about the FY10 Avant-Garde award will be posted on this site soon.

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The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to inform policy and improve practice. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at www.drugabuse.gov. To order publications in English or Spanish, call NIDA's new *DrugPubs* research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or fax or email requests to 240-645-0227 or drugpubs@nida.nih.gov. Online ordering is available at <http://drugpubs.drugabuse.gov>.

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